

Rule R655-4. Water Well Drillers.

As in effect on July 1, 2002

R655-4-12. Abandonment of Wells.

12.1 Temporary Abandonment.

12.1.1 When any well is temporarily removed from service, the top of the well shall be sealed with a tamper resistant, water-tight cap or seal. If a well is in the process of being drilled and is temporarily abandoned, the well shall be sealed with a tamper resistant, water-tight cap or seal and a surface seal installed in accordance with Subsection R655-4-9(9.4). The well may be temporarily abandoned during construction for a maximum of 90 days. After the 90 day period, the temporarily abandoned well shall be permanently abandoned in accordance with the following requirements, and an official well abandonment report (abandonment log) must be submitted in compliance with Section R655-4-4.

12.2 Permanent Abandonment.

12.2.1 The rules of this section apply to the abandonment of the type of wells listed in Subsection R655-4-1(1.2) including private water wells, public supply wells, monitor wells, cathodic protection wells, and heating or cooling exchange wells. A licensed driller shall notify the state engineer prior to commencing abandonment work and submit a complete and accurate abandonment log following abandonment work in accordance with Section R655-4-4 of these rules. Prior to commencing abandonment work, the driller shall obtain a copy of the well log of the well proposed to be abandoned from the well owner or the state engineer, if available, in order to determine the proper abandonment procedure. Any well that is to be permanently abandoned shall be completely filled in a manner to prevent vertical movement of water within the borehole as well as preventing the annular space surrounding the well casing from becoming a conduit for possible contamination of the groundwater supply. A well driller who wishes to abandon a well in a manner that does not comply with the provisions set forth in this section must request approval from the state engineer.

12.3 License Required.

12.3.1 Well abandonment shall be accomplished under the direct supervision of a currently licensed water well driller who shall be responsible for verification of the procedures and materials used.

12.4 Acceptable Materials.

12.4.1 Neat cement grout, sand cement grout, unhydrated bentonite, or bentonite grout shall be used to abandon wells and boreholes. Other sealing materials or additives, such as fly ash, may be used in the preparation of grout upon approval of the state engineer. Drilling mud or drill cuttings shall not be used as any part of a sealing materials for well abandonment. The liquid phase of the abandonment fluid shall be water from a potable municipal system or disinfected in accordance with Subsection R655-4-9(9.6.5).

12.5 Placement of Materials.

12.5.1 Neat cement and sand cement grout shall be introduced at the bottom of the well or required sealing interval and placed progressively upward to the top of the well. The sealing material shall be placed by the use of a grout pipe, tremie line, dump bailer or equivalent in order to avoid freefall, bridging, or dilution of the sealing materials or separation of aggregates from sealants. Sealing material shall not be installed by freefall (gravity) unless the interval to be sealed is dry and no deeper than 30 feet below ground surface. If the well to be abandoned is a flowing artesian well, the well may be pressure grouted from the surface. The well should be capped immediately after placement of seal materials to allow the seal material to set up and not flow out of the well.

12.5.2 Bentonite-based abandonment products shall be mixed and placed according to manufacturer's recommended procedures and result in a seal free of voids or bridges. Granular or powered bentonite shall not be placed under water. When placing unhydrated bentonite, a sounding or tamping tool shall be run in the sealing interval during pouring to measure fill-up rate, verify a continuous seal placement, and to break up possible bridges or cake formation.

12.5.3 The uppermost ten (10) feet of the abandoned well casing or borehole shall consist of neat cement grout or sand cement grout.

12.5.4 Abandonment materials placed opposite any non-water bearing intervals or zones shall be at least as impervious as the formation or strata prior to penetration during the drilling process.

12.5.5 Prior to well or borehole abandonment, all pump equipment, piping, and other debris shall be removed to the extent possible. The well shall also be sounded immediately before it is plugged to make sure that no obstructions exist that will interfere with the filling and sealing. If the well contains lubricating oil that has leaked from a turbine shaft pump, it shall be removed from the well prior to abandonment and disposed of in accordance with applicable state and federal regulations.

12.5.6 Verification shall be made that the volume of sealing and fill material placed in a well during abandonment operations equals or exceeds the volume of the well or borehole to be filled and sealed.

12.6 Termination of Casing.

12.6.1 The casings of wells to be abandoned shall be severed a minimum of two feet below either the natural ground surface adjacent to the well or at the collar of the hole, whichever is the lower elevation. A minimum of two (2) feet of compacted native material shall be placed above the abandoned well upon completion.

12.7 Abandonment of Artesian Wells.

12.7.1 A neat cement grout, sand-cement grout, or concrete plug shall be placed in the confining stratum overlying the artesian zone so as to prevent subsurface leakage from the artesian zone. The remainder of the well shall be filled with sand-cement grout, neat cement grout, bentonite abandonment products, or bentonite grout. The uppermost ten (10) feet of the well shall be abandoned as required in Subsection R655-4-12(12.5.3).

12.8 Abandonment of Drilled and Jetted Wells.

12.8.1 A neat cement grout or sand cement grout plug shall be placed opposite all perforations, screens or openings in the well casing. The remainder of the well shall be filled with cement grout, neat cement, bentonite abandonment products, concrete, or bentonite slurry. The uppermost ten feet of the well shall be abandoned as required in Subsection R655-4-12(12.5.3).

12.9 Abandonment of Gravel Packed Wells.

12.9.1 All gravel packed wells shall be pressure grouted throughout the perforated or screened section of the well. The remainder of the well shall be filled with sand cement grout, neat cement grout, bentonite abandonment products, or bentonite grout. The uppermost ten feet of the well shall be abandoned as required in Subsection R655-4-12(12.5.3).

12.10 Removal of Casing.

12.10.1 It is recommended that the well casing be removed during well abandonment, and when doing so, the abandonment materials shall be placed from the bottom of the well or borehole progressively upward as the casing is removed. The well shall be sealed with sand cement grout, neat cement grout, bentonite abandonment products, or bentonite grout. In the case of gravel packed wells, the entire gravel section shall be pressure grouted. The uppermost ten feet of the well shall be abandoned as required in Subsection R655-4-12(12.5.3).

12.11 Replacement Wells.

12.11.1 Wells which are to be removed from operation and replaced by the drilling of a new well under an approved replacement application, shall be abandoned in a manner consistent with the provisions of Section R655-4-12 before the rig is removed from the site of the newly constructed

replacement well, unless written authorization to remove the rig without abandonment is provided by the state engineer. Also refer to the requirements provided in Subsection R655- 4-4(4.4).

12.12 Abandonment of Cathodic Protection Wells.

12.12.1 The general requirements for permanent well abandonment in accordance with Section R655-4-12 shall be followed for the abandonment of cathodic protection wells.

12.12.2 A cathodic protection well shall be investigated before it is destroyed to determine its condition, details of its construction and whether conditions exist that will interfere with filling and sealing.

12.12.3 Casing, cables, anodes, granular backfill, conductive backfill, and sealing material shall be removed as needed, by re-drilling, if necessary, to the point needed to allow proper placement of abandonment material. Casing that cannot be removed shall be adequately perforated or punctured at specific intervals to allow pressure injection of sealing materials into granular backfill and all other voids that require sealing

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